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The Rocky Mountains spread vistas of rugged beauty in Banff National Park, a showplace of Canada's Alberta

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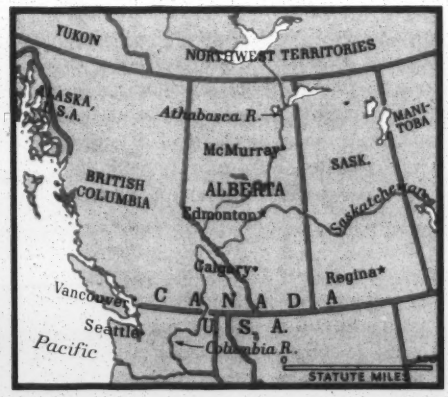

NGS MAP

Banff National Park offers luxury in the midst of a wilderness (see cover) and what tourists call "the million-dollar view" across the Bow Valley.

Fertile plains, their horizons spiked by grain elevators like those below at Parkland, produce a superabundance of grain. Oil, natural gas, and new industries explode isolated crossroads into cities.

In fact, Alberta's wealth has brought problems: how to sell surplus grain, how to increase beef and pork markets.

Less than a century ago wilderness blanketed Alberta. Bands of Indians roamed its plains and hills, living off the plentiful bear, deer, moose, sheep, goats, and gigantic herds of buffalo.

Much of the north country remains a wilderness today. Few Albertans ever see "the bush." Yet much of it would take the plow. It holds barrels of untapped oil. Drilling crews spend lonely winters prospecting here, when the swamps freeze over and can support heavy equipment. In the Peace River District, two belts of farmland cut across this swamp country. Agricultural experts believe the region more suited to livestock than to traditional grain farming. Gradually they persuade the farmers to turn their land into pasture for cattle, sheep, and pigs. The north country will play its role sometime in the future.

The railroad opened up southern Alberta. Cutting across Canada to link British Columbia, Alberta's western neighbor, with the rest of the dominion, it reached Calgary in 1883. Before that, only a few missionaries and traders had ventured into the area. Mounted Police had followed in 1874 to bring law and order to the Indians and to traders from Montana who preyed on the Indians' gullibility.

Ranchers followed the law and the railroad and turned southern prairies into cattle empires. After the ranchers came farmers to transform plains into fields of

ALL PHOTOGRAPHS BY DAVID S. BOYER, NATIONAL GEOGRAPHIC STAFF

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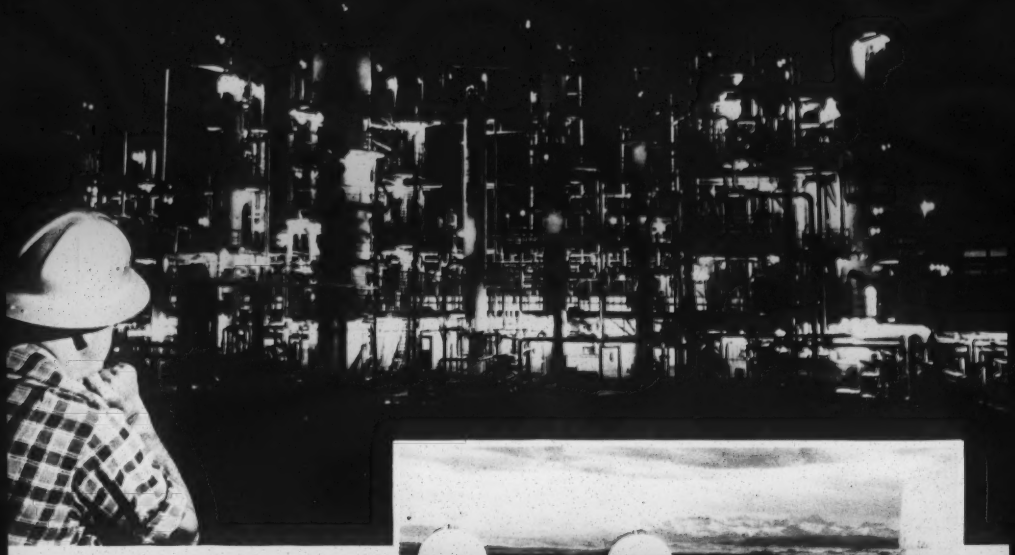

ALBERTA

Western Canada's Boom Province

GLITTERING through the night, the refinery at Edmonton processes oil from some of Canada's wealthiest fields. At right workmen prepare to dynamite loose a shipment of sulphur, by-product of abundant natural gas pools. The two operations symbolize Alberta: a treasure trove of natural riches.

Canada's fifth largest province, Alberta stretches from Montana's border in the United States to the edge of Canada's Northwest Territories (see map below), encompassing 255,285 square miles. From the muskeg country of the north to the gas pools of the south, Nature has made the province rich.

Scenery and winter sports attract thousands to national parklands in the Rocky Mountains that climb Alberta's southwestern border. The Banff Springs Hotel in

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Stampede grounds. Bucking horse riders from all over the western United States and Canada were battling some of the meanest cayuses in captivity. Junior cowpunchers, some freckled and scarcely nine years old, were tumbling on their heads over the horns of wild steers.

"Calf roping, steer decorating, wild cow milking, wild horse saddling, Brahman bull riding—all the western rodeo events were there."

Alberta has made a good living for years from the surface of the land—and still does. The province expects to continue to profit from agriculture for years to come. But Albertans today look past the top six inches of soil that nurture their crops and grass. They peer down thousands of feet at oil and natural gas that will make them richer.

Geologists estimate that about 25 trillion cubic feet of natural gas may lie beneath the province: enough to supply the entire United States for two years.

The southern city of Medicine Hat, built over a pool of gas, lit its streets with natural gas as early as 1890. Lights burned day and night because it was cheaper to let them burn than to pay someone to turn them on and off.

Edmonton, capital of the province, has an even bigger basement full of gas. They joke in that city about water wells so permeated with natural gas you can light the kitchen faucets.

Gas heats homes and powers factories, not only in Alberta but in eastern Canada. Manufacturers use it in making paper, fertilizer, and nylon thread. It goes into the refining of nickel, copper, cobalt, and uranium.

Alberta has so much oil under it—possibly more than 27 billion barrels or enough to supply the United States for nearly eight years—that output is limited only by sales.

Pipelines now carry the products of Edmonton refineries west to Vancouver and Puget Sound, east to Toronto. Workmen dig trenches across the prairie where new pipelines will bear the fuel to warm an Albertan's home or power a Montreal factory.

Along the Athabasca River, in the northeast, lies the greatest known concentration of oil in Canada. But trapped in sand, this will probably be the last to be barreled.

Forests cover more than half the province, mostly in the north. Blessed also with plentiful water supply, Alberta has attracted the pulp and paper industry. L.B.

Stripping herring from nets on Lesser Slave Lake, these boys contribute to high fashion. The catch feeds mink on fur farms. Alberta glitters with well-stocked lakes.

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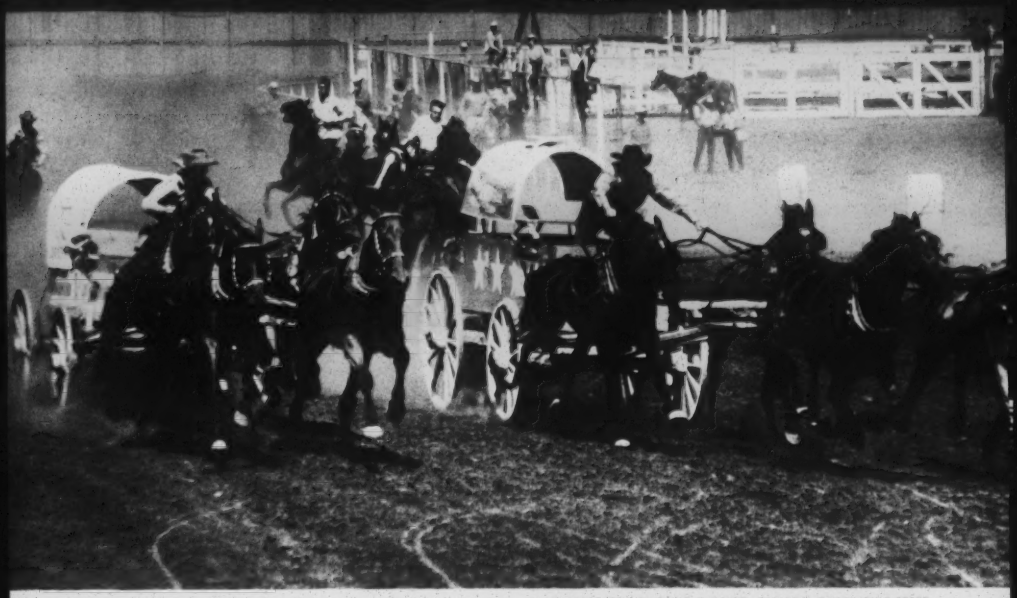

PHOTOGRAPHS BY DAVID S. BOYER, NATIONAL GEOGRAPHIC STAFF

wheat, barley, and oats. Land-hungry people streamed in from eastern Canada and Europe, from the Dakotas, Nebraska, Iowa, Kansas, Minnesota, Illinois.

Mormons, the irrigation experts who had watered Utah, came to Alberta and cut ditches across the parched southwest. It became the sugar beet center of the nation. Refineries today turn sugar beets into sugar for candy, and molasses for cattle feed. Farmers pour corn, peas, carrots, and other crops into freezing plants every day.

Alberta still produces a fourth of Canada's beef, on big ranches and on small farms. The veterinarian at right applies metal eartabs to a cargo of Ontario-bound yearlings, attesting their health.

To honor the rancher, Calgary puts on each July a six-day wing-ding called the Calgary Stampede. Chuck wagons above careen in a thundering version of a Roman chariot race. "Eighth Avenue, Calgary's main street, was cordoned off for action," writes David S. Boyer of the *National Geographic*'s Foreign Staff in the July 1960 *Geographic*. "Cowboy quartets raked banjos and whined out ballads of the western range. Some of their cowboy mates huddled over smoking chuck wagon stoves, serving up flapjacks and bacon into the outstretched hands of tourists from a dozen countries.

"Frontier carts behind teams of buffalo lumbered through the crowds. Feathered Indian bucks, stone-faced squaws, and copper-cheeked papooses in buckskins rode docile pintos nose-to-tail down a gantlet of cameras. In little clearings in the forest of white Stetsons, square dancers swung to and fro.

"Yet all Eighth Avenue's activity could not compare with what was going on down at the

Beaver dam (right) bridges the infant Rio Grande in Colorado. In summer such impounded water quenches the thirst of stock and gives farmers a supply for irrigation ditches. Fish and waterfowl thrive. Below: the teeth that felled the trees. Only lowers are shown. He also has two uppers and a set of back teeth for chewing. He must wear down the foreteeth by gnawing, or, evergrowing, they will prop his mouth open.

WARREN E. GARST, WALT DISNEY PRODUCTIONS

LUIS MARDEN, NATIONAL GEOGRAPHIC STAFF

lost this valuable woodland citizen. Fashion's fondness for beaver hats nearly killed him off. But this same fondness also opened up the North American continent.

When the first white men came, beavers swarmed in streams almost everywhere in North America. Demand for their fur sent French trappers across Canada on snowshoes and American flatboatmen up the Missouri River. Trappers blazed trails that settlers would follow. They bartered with Indians and built trading posts that would become great cities—Winnipeg, Detroit, St. Louis.

Beaver was the coin of the times. In the 1780's, 12 skins bought a gun, and six furs paid for a red Hudson's Bay Company blanket.

The quest for beaver skins spanned three centuries, from Jacques Cartier to Kit Carson. Then in the 1840's, the silk hat began to replace the beaver hat, and the rodent gained a new lease on life. Now he thrives, thanks to protective laws. L.B.

UMI

WALTER A. WEBER, NATIONAL GEOGRAPHIC STAFF ARTIST

Bustling Beavers Stage a Comeback

WHILE SUMMER'S GREEN blankets the marshlands, the little vegetarian at left, gnawing on a felled tree, already feels the nip of winter.

Racing against time, the beaver toils to build himself a warm winter lodge and lay in a supply of food. As woodcutter, hauler, and architect, he has no four-footed peer.

A natural lumberjack, he bases his whole economy on wood: he builds his dam of it, lives in a house of wood, and eats wood. He is a connoisseur; he chooses only trees with the tenderest bark, felling them by tapering the trunks with wrenching bites until they snap. He gnaws them into lengths he can conveniently float to the damsite he has chosen.

With this timber, he first raises a dam across the stream. He piles wood on the stream bed until it rises above the water, then fills the chinks with mud and stones.

In the pond created by the dam, the beaver constructs his house. Supported by sticks and brush heaped on the pond bottom, it rises to a platform a few inches above water. A roof of mud-chinked boughs rises three or four more feet.

Passageways all lead downward. Underwater entrances offer the beaver protection from wolverine, coyote, lynx, and bear. His nose valves shut automatically when he submerges, and large lungs allow him to stay under 10 or 15 minutes.

He does not hibernate, but fills his pantry with a winter's supply of provisions. In order to reach it when the pond freezes over, he anchors his food —short tree limbs—on the bottom with mud and stones. If provisions run short, the beaver must break the ice and flounder through the snow to find a meal.

Building his dams the beaver works as tirelessly and as surely for conservation as the human dambuilder does. Recognizing this, some states have put him to work. Arizona trapped "nuisance" beavers that were damming irrigation canals and transplanted them to uplands where their dams and ponds would check erosion.

Just over a century ago, man nearly

and a Trustee of the National Geographic Society. "It soon became evident that the native kinds ordinarily were secretive and that small birds flittering actively and openly among branches were almost certain to be northern migrants."

The lake area was recently made a sanctuary for birds.

Among the Mayan customs still in evidence are the growing and preparation of food. Ancient Americans domesticated maize, which no longer exists in its wild form. Carvings on ruined temples show them planting the grain with sticks. Archeologists digging into the very beginnings of Maya civilization find indestructible *mano* and *metate*, identical to the grinding stones being used today by the housewife in the picture at right.

The salt fish being hawked in the market in Sololá, below, are an imported treat, a feature of Easter Week festivities. They are brought in from Mexico. Ancient pottery remains convince scientists that somewhat similar trading must have gone on in the early days.

Most of Guatemala's cities and towns, including those ringing Lake Atitlán, lie on the cool mountain plateaus of the south. Larger communities contain many *ladinos*, people of mixed Spanish and Maya ancestry, and a scattering of purely Spanish persons.

Guatemala City, the capital, is the largest, with 300,000 citizens. It was founded in 1776, after an earthquake had devastated the Spanish colonial capital, Antigua.

Bustling Guatemala City is building fast, adding new suburban homes and other structures. It boasts an "Olympic City" of stadium, gymnasium, and pool, and a park exhibit of a 26,908-square-foot map of the country.

Political upheavals—including a short time as a Communist nation and the assassination of a president—have marred Guatemala's modern history. Recent rumors repeat the fear that the Communists may return—with Castro's help.

The country's importance to other capitals of the world is rooted in its geographic position. With coasts facing both the Caribbean and the Pacific, Guatemala occupies a central spot from which the effect of any major event spreads north and south.

Guatemala counts 3,500,000 inhabitants—more than any of the other five Central American nations. It is a little larger than Kentucky in size and population.

About 70 per cent of the people farm—exporting coffee, bananas, and the world's best chicle, the basic material of chewing gum. F.S.

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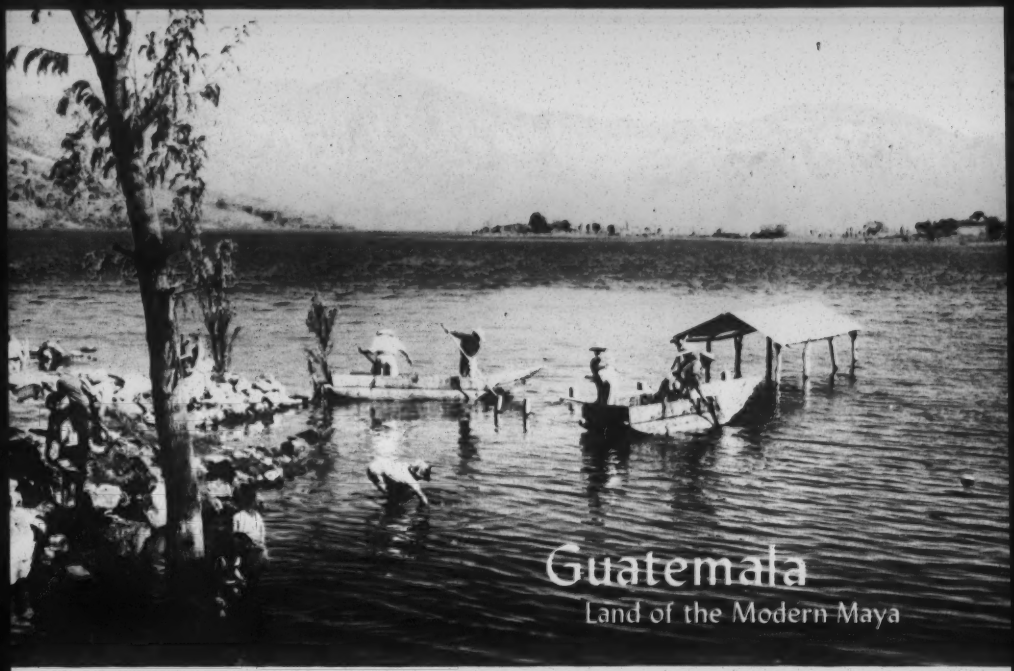


Guatemala
Land of the Modern Maya

PHOTOGRAPHS BY JOHN SCOFIELD, NATIONAL GEOGRAPHIC STAFF

EACH YEAR the Indians of the villages around Lake Atitlán gather water weeds to spread on their gardens.

Although the climate here in the mountains of Guatemala is so pleasant it has been called "the land of perpetual spring," the soil is thin, and the weed mulch enriches it.

The weed-gatherers, like more than half the population of this Central American republic, are descendants of the mighty Maya who built great cities and huge temples long before the white man discovered the New World.

Now they live on farms or in rural villages, clinging to many Mayan customs, including language, but with little understanding of the feats of their ancestors.

Where Christianity has taken hold, it is inevitably mixed with the nature worship of the Indians.

Lake Atitlán is ringed with villages—tradition says there are 12, each named for one of the Apostles. But there are a few more than a dozen, and only four bear Apostles' names. Each of the villages has its own rainbow-bright traditional costume, its own customs and fiestas, even its own special industry.

Indians of Santa Catarina Palopó fish for fresh water crabs and snails. The lake's rope-craft industry is centered in San Pablo la Laguna. The people of San Lucas Tolimán weave mats. San Andrés Semetabaj raises luscious strawberries, artichokes, and asparagus.

Village work is so specialized that the pottery-making center sells its henequin to the rope-making village, then buys back the finished product. For all the villages except one, the lake serves as a crossroads and highway of trade. But as far as San Antonio Palopó is concerned, the lake hardly exists. Stubborn landlubbers all, the villagers neither fish nor boat; they do all their traveling over steep mountain trails.

With its delightful climate, azure waters, and colorful native life, the lake region has become Guatemala's most popular resort. Not only does it attract people, but it is the favorite wintering place for many North American birds—who often behave in the overexuberant manner of the human tourist.

"On certain days migrants predominated over local residents," according to Dr. Alexander Wetmore, the Smithsonian Institution's noted ornithologist

oversize, the front teeth were only as big as modern man's.

"Such teeth were never capable of tearing the skin from creatures the size of rabbits or cats," Dr. Leakey writes. "I know this for a fact, for as an experiment I have tried to strip the hide from a hare with my own teeth and fingernails, and I was not able to do it.

"There is only one answer: Zinjanthropus must have begun making tools about the time he added meat to his diet. And the first things he probably made were crude stone choppers with which to cut up his new-found delicacies. Why he turned to meat we cannot be sure, but it seems likely that he encountered growing competition for available vegetation from the huge herbivores of his time, and simply found a substitute food."

The plant-eating beasts of the time were indeed fantastic. The Leakeys have found fossils of a prehistoric pig the size of a rhinoceros. It had tusks so gigantic that a scientist attributed one to an elephant.

There was a burly, short-necked giraffe with broad, mooselike antlers. Perhaps the most fantastic and dreadful of all was the giant baboon, *Simopithecus jonathani,* named for Dr. Leakey's son, who discovered the beast's jawbone when he was 16. The baboon dwarfs a gorilla—or any ape ever known.

DES BARTLETT, ARMAND DENIS PRODUCTIONS

All these beasts, and Zinjanthropus as well, perished on the lake shore.

Again and again, the lake rose and fell, adding layer after layer of silt and sand on their remains.

Finally, the water vanished, leaving the bodies entombed under several hundred feet of sediments that had hardened into rock.

Some 100,000 years ago—when the bones of Zinjanthropus had lain buried for half a million years—violent earthquakes convulsed the area, fracturing and reshaping the land on a vast scale.

When the tremors ceased, an im-

UMI

PAINTING BY NATIONAL GEOGRAPHIC ARTIST PETER BIANCHI, AFTER A DRAWING IN THE ILLUSTRATED LONDON NEWS

Six Hundred Thousand Years Ago

BIG OF JAW, small of brain, and ugly by our standards, this creature was a man—the earliest known.

He hunted nightmarish beasts along the shores of a long-vanished lake in East Africa some 600,000 years ago.

He walked erect; he probably had some sort of language; and, most important, he had learned to make tools.

"There is the key, the ability to make tools, as distinct from merely using the pointed sticks or sharp stones that lay readily at hand," writes L. S. B. Leakey in the September 1960 *National Geographic*. "Such a being, who set about shaping the raw materials of nature in a regular pattern to suit his needs, was the one worthy to be considered the earliest human."

For 28 years, Dr. Leakey searched the Olduvai Gorge in Tanganyika for fossils of this creature. Last year he found his man. His exploration of the fossil-rich gorge continues under a National Geographic Society grant.

It is painstaking work, much of it done on hands and knees among the rocks in broiling sun. Below, Dr. Leakey and his wife, Mary, go over the ground inch by inch, hunting scraps of bone. Their tools include dental pick and paint brush for extracting the fragile fossils.

Mrs. Leakey found the first piece—the palate and upper teeth. Then, in 19 days of labor, they located some 400 fragments, which, when pieced together, gave us the skull of *Zinjanthropus*, "East Africa Man" (lower right).

From the skull and the animal bones and tools found with it, Dr. Leakey has deduced what life was like for Zinjanthropus. The huge molars—twice as wide as modern man's—indicate a diet of coarse vegetation. But many bones of small mammals, birds, and reptiles—some cracked open to get at the marrow—were found around his camp.

Although the chewing teeth were

PETER BIANCHI, AFTER A DRAWING IN THE ILLUSTRATED LONDON NEWS

Prehistoric game tested earliest man's hunting skills. This sheep, with a horn span of five yards, towers over today's descendant, a merino ram, shown for scale.

mense new chasm had appeared as part of the Great Rift Valley, which stretches from Jordan south through Kenya and Tanganyika. Sands drifted in to choke an erosion-dug side valley, and were in turn eroded away, leaving the Olduvai Gorge, a fossil-hunter's paradise.

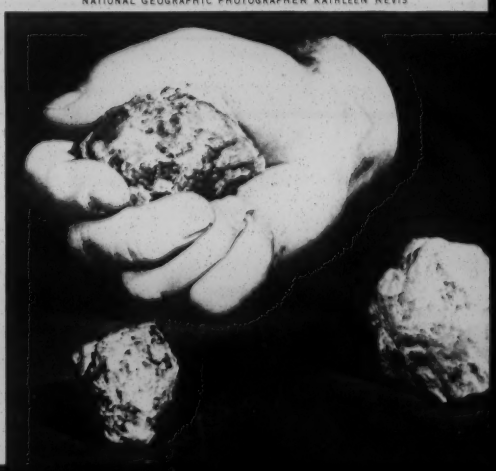
The gorge slices through the beds of rock laid down on the ancient lake shore, revealing layer after layer of earth's history like a giant cake.

Here in 1931, Dr. Leakey found the first tools of Zinjanthropus, and in 1959, the man who made them. The all-important tools are quite simple, merely sharpened rocks (right) and stone axes. They were enough, however, to skin animals—Dr. Leakey, taking nothing for granted, stalked a gazelle himself, killed it by hand, and skinned it with a prehistoric tool.

Although Zinjanthropus may have found the gorge area to his liking, his discoverer has had problems. There is no water available; all supplies must be trucked from a spring 35 miles away. Lions, rhinos, and leopards regularly visit the camp. Once, the Leakeys shared the only water—a deep pool in a dry stream—with two rhinos. "To those who have never lived on rhino bath water, I can only offer my congratulations," Dr. Leakey writes. "The taste stayed with Mary and me for months afterward.

"Another time, when we had a cloudburst, we made funnels out of the tent flaps and collected enough water for everybody to have plenty. We forgot that tent canvas is often treated with copper sulphate for protection against insects. Luckily, it made us ill before we drank enough to kill us outright."

NATIONAL GEOGRAPHIC PHOTOGRAPHER KATHLEEN REVIS



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